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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,073	02/25/2004	Teruo Takizawa	118439	8936
25944	7590	03/13/2006		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER QUINTO, KEVIN V	
			ART UNIT 2826	PAPER NUMBER

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

3/1

<b>Office Action Summary</b>	<b>Application No.</b> 10/785,073	<b>Applicant(s)</b> TAKIZAWA, TERUO	
	<b>Examiner</b> Kevin Quinto	<b>Art Unit</b> 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 4-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,7 and 9-11 is/are rejected.
- 7) ☒ Claim(s) 4,5 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1, 2, and 4-11 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

2. Claims 7, 9, 10, and 11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.
3. Claim 7 fails to further limit independent claim 2. Claims 9 and 10 include limitations already in independent claims 1 and 2.
4. Claim 9 is further objected to because of the following informalities: the phrase "Akihiro semiconductor device." Appropriate correction is required.
5. The examiner believes that the intended phrase is *A semiconductor device*.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staab et al. (USPN 5,610,790) in view of Yamazaki et al. (United States Patent Application Publication No. US 2003/0092213 A1).

8. In reference to claims 1, 7, and 9, Staab et al. (USPN 5,610,790, hereinafter referred to as the "Staab" reference) discloses a similar device. Figure 5 of Staab discloses a semiconductor device with a diode including an insulating substrate (501). There is a p-type silicon layer (502 or both 502 and 504) and n-type silicon layer (503 or both 503 and 504) which are both in contact with the insulating substrate or layer (501). Staab does not disclose doping the silicon with p-type germanium. Yamazaki et al. (United States Patent Application Publication No. US 2003/0092213 A1, hereinafter referred to as the "Yamazaki" reference) discloses that germanium is a known p-type dopant (p.7, paragraph 84). The applicant is reminded in this regard that it has been held that mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. In re Leshin 125 USPQ 416. Therefore claims 1, 7, and 9 are not patentable over the Staab reference.

9. Claims 2, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staab et al. (USPN 5,610,790) in view of Yamazaki et al. (United States Patent Application Publication No. US 2003/0092213 A1).

10. In reference to claims 2, 10, and 11, Staab (USPN 5,610,790) discloses a similar device. Figure 5 of Staab discloses a semiconductor device with a diode including an insulating substrate (501). There is a p-type silicon layer (502) and n-type silicon layer

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(503) which are both in contact with the insulating substrate (501). An intrinsic silicon layer (504) is junctioned to the p-type silicon layer (502) and n-type silicon layer (503) and is also in contact with the insulating substrate or layer (501). Staab does not disclose doping the silicon with p-type germanium. Yamazaki et al. (United States Patent Application Publication No. US 2003/0092213 A1, hereinafter referred to as the "Yamazaki" reference) discloses that germanium is a known p-type dopant (p.7, paragraph 84). The applicant is reminded in this regard that it has been held that mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. In re Leshin 125 USPQ 416. Therefore claims 2, 10, and 11 are not patentable over the Staab reference.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Staab et al. (USPN 5,610,790) in view of Yamazaki et al. (United States Patent Application Publication No. US 2003/0092213 A1) and further in view of Beasom (United States Patent Application Publication No. US 2003/0071291 A1) and further in view of Shopbell (USPN 6,055,460) and further in view of Farber et al. (USPN 6,187,684 B1).

12. In reference to claim 6, Staab (USPN 5,610,790) discloses a similar method of fabrication. Figure 5 of Staab discloses a semiconductor device with a diode including an insulating substrate (501). There is a p-type silicon layer (502 or both 502 and 504) and n-type silicon layer (503 or both 503 and 504) both disposed on the insulating substrate or layer (501). Staab does not disclose doping the silicon with p-type germanium. Yamazaki et al. (United States Patent Application Publication No. US

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2003/0092213 A1, hereinafter referred to as the "Yamazaki" reference) discloses that germanium is a known p-type dopant (p.7, paragraph 84). The applicant is reminded in this regard that it has been held that mere selection of known materials generally understood to be suitable to make a device, the selection of the particular material being on the basis of suitability for the intended use, would be entirely obvious. In re Leshin 125 USPQ 416. Therefore this limitation is not patentable over the Staab reference. Staab does not disclose forming silicon-germanium mixed crystal by implanting germanium to the p-type silicon layer. However this method of forming silicon germanium is well known in the art. Beasom (United States Patent Application Publication No. US 2003/0071291 A1) discloses that using ion implantation (implanting germanium into silicon) in order to form silicon germanium is a known method (p.4, paragraph 39). Furthermore Shopbell (USPN 6,055,460) discloses that ion implantation has the benefit of taking place in a clean environment (column 6, lines 35-38). Farber et al. (USPN 6,187,684 B1, hereinafter referred to as the "Farber" reference) discloses that fabrication in a clean environment is desired in the semiconductor art (column 2, lines 23-26). In view of Beasom, Shopbell, and Farber, it would therefore be obvious to utilize ion implantation as the means of forming silicon germanium mixed crystal.

### ***Allowable Subject Matter***

13. Claims 4, 5, and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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14. The following is a statement of reasons for the indication of allowable subject matter: the examiner is unaware of any prior art which suggests or renders obvious a bridge rectifier circuit with a plurality of diodes wherein each of the diodes has the explicit structure as suggested by the applicant.

*[Handwritten signature]*  
SUPERVISOR, PATENT EXAMINER  
TECHNOLOGY CENTER 2800

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quinto whose telephone number is (571) 272-1920. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KVQ